Trend Study 14-29-99

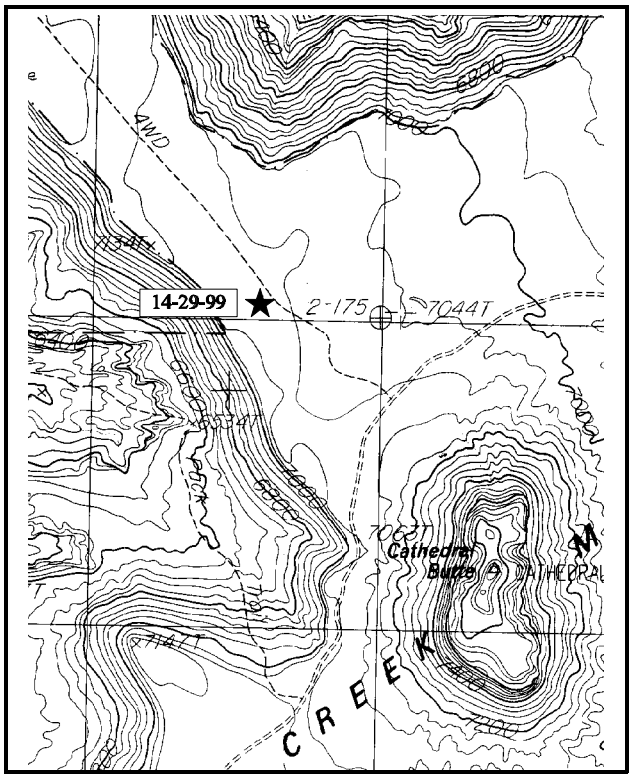
Study site name: Salt Creek Mesa . Range type: Chained, Seeded P-J.

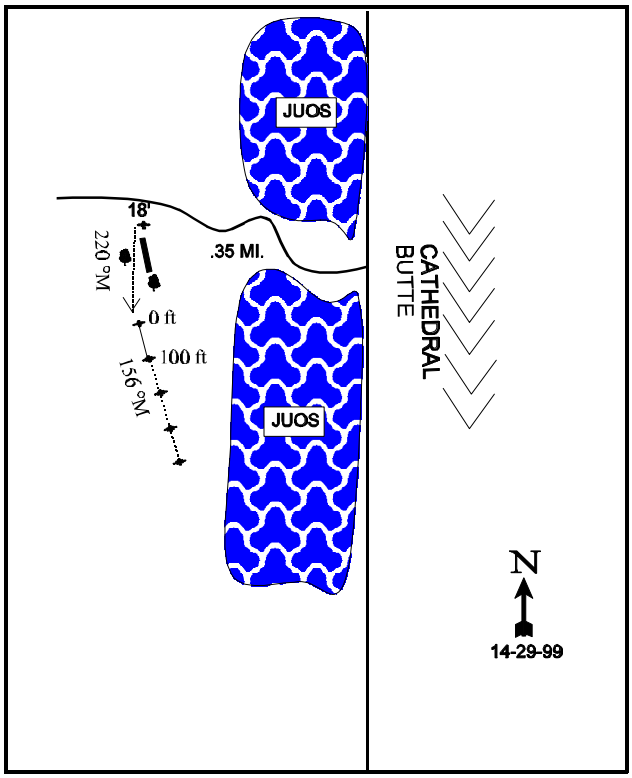
Compass bearing: frequency baseline 156°M.

Footmark (first frame at) 5 feet, footmarks (frequency belts) line 1 (11 & 71ft), line 2 (34ft), line 3 (59ft), line 4 (95ft).

LOCATION DESCRIPTION

From the intersection in Sego Flat, go left towards Dugout Ranch 5.9 miles to the Beef Basin turnoff. Continue down Salt Creek Mesa Road for 5.1 miles to a cattleguard at the BLM/USFS boundary. Continue 1.6 miles on the main road to a fence/gate. Continue 1.9 miles to a fork on the west side of Cathedral Butte. Turn left and go 0.3 miles through junipers, into a chaining and to a witness post (full-high fence post) 18 feet off the road. The 0-foot baseline is 15 paces at a bearing of 220°M from the witness post.




Map Name: Cathedral Butte

Diagrammatic Sketch

Township 32S , Range 20E , Section 27

UTM 4202030.680 N, 613622.030 E

## DISCUSSION

### Trend Study No. 14-29 (36-17)

The Salt Creek Mesa is a new study that was established in 1992 on an old chaining, mostly due to its importance to wintering deer and elk. The treated area appears to have been seeded with crested wheatgrass, intermediate wheatgrass, and alfalfa. Visually, the seeded grasses dominate the understory of this site which has a northeast aspect and a 3% slope. This chained site also supports a high density of released pinyon and juniper trees that are now in the 6 to 10 foot height. This would indicate that most of the trees are individuals that escaped the chaining because of their small size and now have been released from competition with the chained adult trees. Point quarter data estimated 59 pinyon trees/acre in 1992 and 60 pinyon trees/acre in 1999. Average diameter was estimated at 3.5 inches in 1999. Juniper density was about 33 trees/acre in 1992, increasing to 51 by 1999. Average diameter of juniper was estimated at 2.8 inches in 1999. Shrub strip data, which better estimates density of young and seedling trees, estimated 120 juniper and 140 pinyon seedlings/acre.
The soil varies in depth from 11 inches to 22 inches due to a layer of soft sandstone which is also found on the surface in some places. The sandy soil is noticeably deeper on the lower portions of the site. Effective rooting depth averages almost 15 inches over the whole site. Soil texture is a sandy clay loam with a slightly alkaline pH (7.5). Phosphorus is low at 5.3 ppm. Values less than 10 ppm may limit normal plant growth and development. There are many wind scoured depressions with large rock scattered throughout the site. Pavement is commonly found in small localized intervals. Litter, comprised mostly pinyon-juniper debris from the chaining, is abundant but declining. Even with fairly good cover, there are small scattered bare areas where erosion (both wind and water) is occurring. Percent bare ground was quite high at 39% in 1999.

Useful browse are limited on the site. Only a low density of Utah serviceberry, four-wing saltbush, true-mountain mahogany, and green ephedra are found within the chaining. Use of these shrubs varies from light to heavy. The most abundant browse is broom snakeweed with an estimated population of 9,960 plants/acre in 1992. It has since increased to 23,760 plants/acre by 1999. Snakeweed grows in thick patches where there is little perennial grass. Mature plants are small, measuring only 6 inches in height. Density will likely not increase much in the future unless perennial grasses decline.

The dominant herbaceous species are intermediate wheatgrass, crested wheatgrass, and Indian ricegrass. Forbs are lacking with two species, dusty penstemon (a desirable species), and Fendler euphorbia (an undesirable increaser), providing 90% of the forb cover in 1992 and 73% in 1999. All other species occur rarely.

#### 1992 APPARENT TREND ASSESSMENT

The soil trend is considered stable with percent bare ground at 22%. There are small scattered bare areas where erosion is occurring. Because of the low densities for all browse except for broom snakeweed, which demonstrates characteristics of an expanding population, trend for browse appears to be declining. The herbaceous understory is in good condition with the forbs and grasses together making up 79% of the vegetative cover and grasses alone constituting 66% of the total vegetative cover. Trend, after only being sampled once, should be considered stable until the next sampling date.

#### 1999 TREND ASSESSMENT

Trend for soil is down due to a decline in litter cover from 50% to 33% and an increase in percent bare ground from 22% to 39%. Vegetation and litter distribution are variable with bare areas showing signs of wind and water erosion. Trend for browse is down due to stable, mostly declining populations of preferred species combined with a dramatic increase in density of broom snakeweed. Trees are also increasing in density and cover. Trend for the herbaceous understory is down due to a significant decline in the sum of nested

frequency of intermediate wheatgrass. It was the dominant grass in 1992. Crested wheatgrass and Indian ricegrass remained stable. Forbs are still rare but nested frequency increased slightly.

TREND ASSESSMENT
soil - down
browse - down
herbaceous understory - down

HERBACEOUS TRENDS --
Herd unit 14 , Study no: 29

| Type | Species | Nested Frequency '92 | '99 | Quadrat Frequency '92 | '99 | Average Cover % '92 | '99 |
|---|---|---|---|---|---|---|---|
| G | Agropyron cristatum | 112 | 106 | 37 | 39 | 5.34 | 5.89 |
| G | Agropyron intermedium | 230 | *169 | 66 | 59 | 13.05 | 2.52 |
| G | Oryzopsis hymenoides | 96 | 80 | 49 | 35 | 5.10 | 1.70 |
| G | Sitanion hystrix | - | - | - | - | - | .00 |
| G | Stipa comata | - | - | - | - | - | .00 |
| Total for Annual Grasses | | 0 | 0 | 0 | 0 | 0 | 0 |
| Total for Perennial Grasses | | 438 | 355 | 152 | 133 | 23.50 | 10.13 |
| Total for Grasses | | 438 | 355 | 152 | 133 | 23.50 | 10.13 |
| F | Chenopodium album (a) | 4 | - | 3 | - | .01 | - |
| F | Chaenactis douglasii | - | 1 | - | 1 | - | .03 |
| F | Cryptantha spp. | - | 3 | - | 2 | - | .03 |
| F | Descurainia pinnata (a) | 5 | 2 | 4 | 1 | .02 | .00 |
| F | Euphorbia fendleri | 44 | 25 | 13 | 10 | 2.37 | .52 |
| F | Lesquerella spp. | 14 | 25 | 7 | 13 | .03 | .09 |
| F | Lupinus spp. | - | *4 | - | 3 | - | .04 |
| F | Machaeranthera canescens | 2 | 1 | 2 | 1 | .01 | .03 |
| F | Medicago sativa | 7 | *- | 5 | - | .22 | - |
| F | Orobanche spp. | 2 | - | 1 | - | .00 | - |
| F | Penstemon comarrhenus | 43 | *55 | 16 | 29 | .82 | 1.06 |
| F | Salsola pestifer (a) | 10 | - | 4 | - | .02 | - |
| F | Senecio multilobatus | - | *14 | - | 9 | - | .30 |
| F | Sphaeralcea coccinea | - | 1 | - | 1 | - | .00 |
| F | Streptanthus cordatus | 1 | - | 1 | - | .00 | - |
| F | Townsendia spp. | - | 3 | - | 2 | - | .03 |
| F | Tragopogon dubius | 3 | - | 1 | - | .00 | - |
| Total for Annual Forbs | | 19 | 2 | 11 | 1 | 0.05 | 0.00 |
| Total for Perennial Forbs | | 116 | 132 | 46 | 71 | 3.48 | 2.16 |
| Total for Forbs | | 135 | 134 | 57 | 72 | 3.54 | 2.16 |

* Indicates significant difference at % = 0.10

BROWSE TRENDS --
Herd unit 14 , Study no: 29

| Type | Species | Strip Frequency '92 | '99 | Average Cover % '92 | '99 |
|---|---|---|---|---|---|
| B | Amelanchier utahensis | 2 | 2 | 1.36 | 1.77 |
| B | Atriplex canescens | 3 | 1 | .03 | - |
| B | Cercocarpus montanus | 3 | 3 | .03 | 1.00 |
| B | Ephedra viridis | 0 | 1 | - | - |
| B | Gutierrezia sarothrae | 80 | 87 | 3.77 | 6.47 |
| B | Juniperus osteosperma | 5 | 6 | .18 | .59 |
| B | Mahonia fremontii | 2 | 0 | - | - |
| B | Mahonia repens | - | - | .15 | - |
| B | Opuntia spp. | 1 | 0 | - | - |
| B | Pinus edulis | 6 | 7 | 3.15 | 4.44 |
| B | Purshia tridentata | 0 | 0 | - | - |
| B | Pseudotsuga menziesii | - | - | .03 | - |
| B | Symphoricarpos oreophilus | 2 | 1 | .06 | .38 |
| Total for Browse | | 104 | 108 | 8.76 | 14.65 |

CANOPY COVER --
Herd unit 14 , Study no: 29

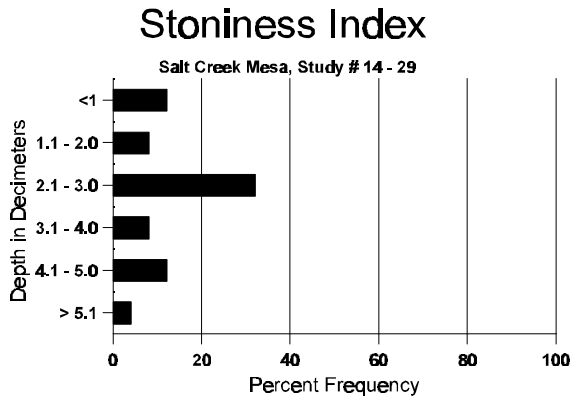
| Species | Percent Cover '99 |
|---|---|
| Amelanchier utahensis | 2 |
| Pinus edulis | 4 |

BASIC COVER --
Herd unit 14 , Study no: 29

| Cover Type | Nested Frequency '92 | '99 | Average Cover % '92 | '99 |
|---|---|---|---|---|
| Vegetation | 362 | 347 | 32.15 | 25.35 |
| Rock | 37 | 84 | 8.50 | 2.85 |
| Pavement | 90 | 235 | 0 | 4.39 |
| Litter | 283 | 417 | 50.20 | 32.48 |
| Bare Ground | 265 | 408 | 22.32 | 39.33 |

SOIL ANALYSIS DATA --
Herd Unit 14, Study # 29, Study Name: Salt Creek Mesa

| Effective rooting depth (inches) | Temp °F (depth) | pH | %sand | %silt | %clay | %0M | PPM P | PPM K | dS/m |
|---|---|---|---|---|---|---|---|---|---|
| 14.5 | 62.6 (14.4) | 7.5 | 56.0 | 21.4 | 22.6 | 2.7 | 5.3 | 92.8 | 0.6 |




PELLET GROUP FREQUENCY --
Herd unit 14 , Study no: 29

| Type | Quadrat Frequency '92 | '99 | Pellet Transect Days Use/Acre (ha) '99 |
|---|---|---|---|
| Rabbit | 39 | 37 | N/A |
| Elk | 4 | 21 | 18 (44) |
| Deer | 17 | 16 | 19 (47) |
| Cattle | 8 | 10 | 23 (57) |

BROWSE CHARACTERISTICS --
Herd unit 14 , Study no: 29

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Amelanchier utahensis | | | | | | | | | | | | | | | | | | |
| Y | 92 | - | - | - | - | - | - | 1 | - | - | 1 | - | - | - | 20 | | | 1 |
| | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| M | 92 | - | - | 1 | - | - | - | - | - | - | 1 | - | - | - | 20 | - | - | 1 |
| | 99 | - | - | - | 1 | - | - | - | 1 | - | 2 | - | - | - | 40 | 98 | 125 | 2 |
| X | 92 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | 20 | | | 1 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 00% | 50% | 00% | + 0% |
| '99 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | Dec: | |
|---|---|---|---|---|
| | '92 | 40 | | - |
| | '99 | 40 | | - |

| Atriplex canescens | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 92 | - | - | 2 | - | - | - | - | - | - | 2 | - | - | - | 40 | - | - | 2 |
| | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | 23 | 26 | 0 |
| D | 92 | - | - | - | - | - | 1 | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 99 | - | - | 1 | - | - | - | - | - | - | - | - | - | 1 | 20 | | | 1 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 00% | 100% | 00% | -67% |
| '99 | 00% | 100% | 100% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | Dec: | |
|---|---|---|---|---|
| | '92 | 60 | | 33% |
| | '99 | 20 | | 100% |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cercocarpus montanus | | | | | | | | | | | | | | | | | | |
| Y | 92 | - | - | 3 | - | - | - | - | - | - | 3 | - | - | - | 60 | | | 3 |
| | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| M | 92 | - | 1 | 1 | - | - | - | - | - | - | 2 | - | - | - | 40 | - | - | 2 |
| | 99 | - | - | 1 | 1 | 1 | - | - | - | - | 3 | - | - | - | 60 | 48 | 55 | 3 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 20% | 80% | 00% | -40% |
| '99 | 33% | 33% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '92 | 100 | Dec: | | - |
| '99 | 60 | | | - |

| Ephedra viridis | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | 92 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 99 | - | - | - | 1 | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 00% | 00% | 00% | |
| '99 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '92 | 0 | Dec: | | - |
| '99 | 20 | | | - |

| Gutierrezia sarothrae | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | 92 | 16 | - | - | 1 | 1 | - | - | - | - | 18 | - | - | - | 360 | | | 18 |
| | 99 | 4 | - | - | - | - | - | - | - | - | 4 | - | - | - | 80 | | | 4 |
| Y | 92 | 101 | - | - | - | - | - | - | - | - | 101 | - | - | - | 2020 | | | 101 |
| | 99 | 151 | - | - | - | - | - | - | - | - | 151 | - | - | - | 3020 | | | 151 |
| M | 92 | 383 | - | - | - | - | - | 10 | - | - | 393 | - | - | - | 7860 | - | - | 393 |
| | 99 | 1029 | - | - | - | - | - | - | - | - | 1029 | - | - | - | 20580 | 6 | 9 | 1029 |
| D | 92 | 3 | - | - | - | - | - | 1 | - | - | 2 | - | 2 | - | 80 | | | 4 |
| | 99 | 8 | - | - | - | - | - | - | - | - | 6 | - | - | 2 | 160 | | | 8 |
| X | 92 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | 200 | | | 10 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 00% | 00% | .40% | +58% |
| '99 | 00% | 00% | .16% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '92 | 9960 | Dec: | | 1% |
| '99 | 23760 | | | 1% |

| Juniperus osteosperma | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | 92 | 3 | 1 | - | - | - | - | - | - | - | 4 | - | - | - | 80 | | | 4 |
| | 99 | 6 | - | - | - | - | - | - | - | - | 6 | - | - | - | 120 | | | 6 |
| M | 92 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | - | - | 1 |
| | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| X | 92 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | 20 | | | 1 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 20% | 00% | 00% | +17% |
| '99 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '92 | 100 | Dec: | | - |
| '99 | 120 | | | - |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mahonia fremontii | | | | | | | | | | | | | | | | | | |
| M | 92 | - | 1 | 1 | - | - | - | - | - | - | 1 | 1 | - | - | 40 | - | - | 2 |
| | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 50% | 50% | 00% | |
| '99 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '92 | 40 | Dec: | | - |
| '99 | 0 | | | - |

| Opuntia spp. | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | 92 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 00% | 00% | 00% | |
| '99 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '92 | 20 | Dec: | | - |
| '99 | 0 | | | - |

| Pinus edulis | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | 92 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 99 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| Y | 92 | 2 | 2 | - | - | - | - | - | - | - | 4 | - | - | - | 80 | | | 4 |
| | 99 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 40 | | | 2 |
| M | 92 | 3 | - | - | - | - | - | - | - | - | 3 | - | - | - | 60 | - | - | 3 |
| | 99 | 1 | - | - | 1 | - | - | 3 | - | - | 5 | - | - | - | 100 | - | - | 5 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 29% | 00% | 00% | + 0% |
| '99 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '92 | 140 | Dec: | | - |
| '99 | 140 | | | - |

| Purshia tridentata | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 92 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | 6 | 15 | 0 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 00% | 00% | 00% | |
| '99 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '92 | 0 | Dec: | | - |
| '99 | 0 | | | - |

| Symphoricarpos oreophilus | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 92 | - | - | 2 | - | - | - | - | - | - | 2 | - | - | - | 40 | - | - | 2 |
| | 99 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | 39 | 82 | 1 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '92 | 00% | 100% | 00% | -50% |
| '99 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '92 | 40 | Dec: | | - |
| '99 | 20 | | | - |